



**US Army Corps  
of Engineers®**

Engineer Research and  
Development Center

**Product**

# Debris Removal Bar Code Tracking Database

## Technology

ERDC's Construction Engineering Research Laboratory (CERL) designed and implemented a bar code tracking/database system to replace the hand-written load tickets used in the Corps of Engineers disaster debris removal program. The system consists of a simple and efficient combination of three basic electronic components: (1) a hand-held, ruggedized personal digital assistant (PDA), (2) a battery-operated bar code reader, and (3) a printer. The system operates as follows:

1. When the Corps employee initially measures/certifies the debris truck, a unique bar code is attached to the vehicle placard.
2. When the vehicle reaches the tower at the dump, the employee identifies the vehicle with the hand-held bar code reader.
3. The vehicle's identifying data is automatically displayed on the bar code reader screen.
4. The employee in the tower determines the load in the truck and communicates that information to the employee on the ground.
5. The employee on the ground enters the load on the handheld device.
6. The wireless (Bluetooth) handheld device transfers the ticket information to the printer.
7. The printer prints two copies of each ticket (one for the driver and a second for government records).
8. At the end of the day, the data from the handheld PDA is uploaded to a standard PC on-site, and the results are converted to an electronic data file that can then be e-mailed to a central site for import into the main system.

## Problem

Debris removal is a major component of every disaster recovery operation. Every year natural disasters, such as fires, floods, earthquakes, hurricanes, and tornadoes generate large amounts of debris that cause considerable disposal challenges. The large amount of debris caused by Hurricane Katrina in August 2005 highlighted the need to improve paper-based recordkeeping processes used in the Corps of Engineers disaster debris removal program, which relies on load tickets hand-written in the field.



**Left to right: the identified Inspector logs the driver and classifies the load in three quick steps.**

**Expected Cost To Implement**

A representative *Debris Removal Bar Code Tracking Database* (a geographically broad, county-wide, networked system) would cost approximately \$20,000, assuming that customer requirements were:

- Equipment (five PDA/printers and one laptop PC) \$15,000
- Software implementation (CERL's fee) \$5,000

**Benefits/Savings**

The primary advantages of the debris removal bar code tracking database over the traditional paper-based system are that:

1. It greatly improves accuracy of all data in the debris management program by eliminating data transcription errors, redundant data, and discrepancies between contractor and government data.
2. The database system significantly reduces staffing requirements and program cost. During the Hurricane Katrina debris removal effort in Jackson County, MS, the system saved an estimated 5,500 hours of labor, or at least \$150,000 per month.

**Status**

The *Debris Removal Bar Code Tracking Database* system has been successfully Beta-tested in New Orleans, LA during the Hurricane Katrina cleanup, and can be easily adapted and applied to other similar applications.

**ERDC POC(s)**

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**Distribution Sources**

The *Debris Removal Bar Code Tracking Database* system is available on request from the listed ERDC-CERL POCs. CERL can provide basic customization to suit customer needs as part of the "software implementation" mentioned above.

**Available Training**

Formal training has not yet been authored for this Beta-tested product. However, classroom or field training can be made available through the listed ERDC-CERL POCs, on a reimbursable basis.

**Available Support**

Corps customers may request support for this beta-tested product (e.g., data base customization or hardware configuration to suit customer needs) on a reimbursable basis through the listed ERDC-CERL POCs.